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(54) **Improvements relating to lavatory cleaning blocks**

(57) The foaming behaviour and the chlorine release of lavatory blocks can be improved by the use of an alkoxylated alcohol surfactant. A first aspect of the invention provides for the use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a foam booster in a rim block comprising an anionic surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent. A second aspect of the invention provides for the use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a chlorine release improver in a rim block comprising an anionic

surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent. It is preferred that the alkoxylated alcohol is an ethoxylated alcohol. The preferred level of alkoxylated alcohol is 0.75-2%wt. The preferred ethoxy chain length is at least 25 units, preferably 40-60. An average ethoxy chain length of around 50 is particularly preferred. Typically, blocks according to the present invention comprise, in addition to the above-mentioned, alkoxylated alcohol 30 to 80% by weight of an anionic surfactant; 0 to 50% by weight of an inert and/or electrolyte filler and 5 to 50% by weight of a water-soluble bleaching agent.

Description**Technical Field**

5 The present invention relates to lavatory cleaning blocks including those which are intended, in use, to be located under the rim of a lavatory bowl or urinal such that, during a flushing cycle, water from the cistern flows over the block thereby dissolving a portion of the block. Such blocks are generally known in the art as 'rim blocks' and will be referred to as such or simply as 'lavatory blocks' or 'blocks' herein. The term 'blocks' is also intended to embrace so-called 'in-cistern' blocks which are placed in the cistern of a lavatory or urinal and dissolve slowly therein.

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Background to the Invention

15 WO 92/03532 (JEYES) discloses that rim blocks generally comprise a surfactant component and a solubility retarding component. Typically, the surfactant is an anionic present at a level of 5-85% by weight of the block, although other surfactant components such as nonionics can be present: levels of less than 10% of nonionics being preferred. Blocks can also comprise inert fillers, water softening agents, colouring agent and perfumes. The document discloses a common process for the manufacture of these blocks, by extrusion of the components into a bar which is subsequently cut into blocks. WO 92/03532 discloses that the extrusion of the blocks is assisted by the presence of polysaccharide gums, which function as lubricant processing aids.

20 EP-A-341836 (JEYES) discloses an extruded lavatory cleansing block with a good sanitising and cleansing effect, which block comprises an anionic surfactant and a chlorinated cyanuric acid derivative. The preferred method of manufacture is again by extrusion in which case less than 25% wt and preferably 3-15% wt of a processing aid is added. Suitable processing agents are described as lower ethoxylated alcohol or alkyl phenols, higher alcohols or chlorinated hydrocarbons.

25 EP-A-526437 (KIWI) discloses the use of stabilisers selected from the group comprising mineral oils, silicone fluids and polybutene. The preferred method of manufacture is again by extrusion in which case less than 25% wt and preferably 1-15% wt of a processing aid is added. Suitable processing agents are described as lower ethoxylated alcohol or alkyl phenols.

30 Brief Description of the Invention

We have determined that the foaming behaviour and the chlorine release of blocks can be improved by the use of an alkoxylated alcohol surfactant

35 Accordingly the first aspect of the present invention provides for the use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a foam booster in a lavatory block comprising an anionic surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent.

40 According to a second aspect of the present invention provides for the use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a chlorine release improver in a rim block comprising an anionic surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent.

Detailed Description of the Invention

45 It is preferred that the alkoxylated alcohol is an ethoxylated alcohol. The preferred level of alkoxylated alcohol is 0.75-2%wt. The preferred ethoxy chain length is at least 25 units, preferably 40-60. An average ethoxy chain length of around 50 is particularly preferred. Suitable materials include Empilan KM 50/KF (TM) ex. Albright & Wilson.

Typically, blocks according to the present invention comprise, in addition to the above-mentioned, alkoxylated alcohol 30 to 80% by weight of an anionic surfactant; 0 to 50% by weight of an inert and/or electrolyte filler and 5 to 50% by weight of a water-soluble bleaching agent.

50 The anionic surfactants which may be used in the present invention include for example alkali metal salts of alkyl substituted benzene sulphonates, alkali metal long chain alkyl sulphates, alkali metal ether sulphates derived from long chain alcohols and alkyl phenols, alkali metal alkane sulphonates, alkali metal olefin sulphonates and alkali metal sulphosuccinates, whereby the sodium salts are generally preferred.

55 The most favoured anionics are sodium alkyl benzene sulphonates. Desirably, the anionic surfactant used in the block is present at a level of 40-60%wt, with levels of 40-50% being particularly preferred. Suitable materials include Nansa HS 80/GPF (TM) ex. Albright & Wilson.

Suitable fillers include ionic fillers and inert fillers. Suitable fillers include one or more of urea, sodium, magnesium and calcium carbonates, sodium chloride, borax, talc and sodium, magnesium and calcium sulphates. Preferred ionic fillers include sodium sulphate. Preferred inert fillers include calcium carbonate. Typical levels of filler range from

5-30%wt in total. Preferred levels of filler are 5-15% of ionic filler and 5-15% of inert filler. It is particularly preferred to use an approximately 50:50 mixture of sodium sulphate and calcium carbonate as the filler.

Preferably, the weight ratio between the anionic surfactant and the filler, if electrolytic, is greater than 2.

5 Suitable bleaching agents active-halide and active-oxygen bleaching agents. It is important that the bleaching agent is at least sparingly soluble in water.

10 Halide bleaching agents are preferred. Suitable water-soluble, active chlorine, bleaching agents used in accordance with the invention include chlorinated cyanurates, phthalimides, p-toluene sulphonamides, azodicarbonamides, hydantoins, glycoluracils, amines and melamines. The alkali metal salts of cyanurates are preferred. A particularly preferred bleaching agent is sodium dichlorocyanurate. The bleaching agent is most preferably present in an amount of 10 to 25% by weight. Oxidan DCN/WSG (TM) ex. Sigma has been found to be a suitable bleaching agent.

15 Preferably, the blocks further comprise 1 to 15% by weight of a hydrophobic oily liquid perfume. The blocks more preferably comprise 4-9% by weight of the perfume. Levels of around 6% are particularly preferred. This is preferably the liquid oily perfume is of the kind described in the European patent application 167,210. It will be understood that the liquid oily perfume must be stable in the presence of the water-soluble, active chlorine, bleaching agent. Suitable oily perfumes can be easily selected by testing them in combination with the water-soluble, active chlorine, bleaching agent. Examples of suitable bleach-stable perfumes are Verdeo 898, Bonanza 048 and Ponderosa 431 all ex IFF, and LB 132 ex Quest. Particularly preferred perfumes are Icebreaker Super Mod, Oxygen Supra Mod, Motebianco Supra and lemonfit Supra (all TM) ex Givaudan Roure.

20 Minor components will generally be present but are optional. These include colouring agents, and/or whiteners. These materials should be chosen such that they are compatible with the bleaching agent and do not react therewith to a significant extent. We have determined that 'Sudangelb 150' (TM) ex. Sandoz is an acceptable colouring agent as are Colanyl Green (TM) ex Hoechst and Dispers Blue (TM) ex BASF. Titanium dioxide is an acceptable whitener.

25 An optional minor component is a foam-boosting surfactant. Suitable surfactants include nitrogen-containing surfactants including amphoteric surfactants such as betaines, amine oxides and ethanolamides.

Blocks according to the present invention are manufactured by an extrusion process as known in the art: i.e. the ingredients are mixed to form a dough, which is then extruded into a rod or bar which is cut into blocks of suitable lengths. As used herein the term block is not intended to limit the shape of the eventual product.

In order that the invention may be further understood it will be described hereafter by way of example.

30 Examples

The components listed in Table 1 were mixed in the proportions specified and extruded in the form of a bar which was then cut into blocks. All proportions are given in weight % as throughout the specification unless stated otherwise.

35 Table 1

| EXAMPLE | COMPONENT | 1 | 2 | 3 | 4 |
|-----------------|----------------------|-------|-------|-------|-------|
| Anionic | Nansa HS 80/GPF | 47.8 | 47.8 | 47.8 | 47.8 |
| Nonionic | Empilan KM50/KF | 1.00 | 1.00 | 1.00 | 1.00 |
| Bleaching Agent | Oxidan DCN/WSG | 15.0 | 15.0 | 15.0 | 15.0 |
| Ionic Filler | Sodium Sulphate | 8.95 | 8.70 | 8.95 | 8.95 |
| Inert Filler | Calcium Carbonate | 8.95 | 8.75 | 8.95 | 8.95 |
| Perfume | Oxygen Supra Mod | 6.00 | - | - | - |
| | Montebianco Supra | - | 6.00 | - | - |
| | Lemonfit Supra | - | 6.00 | - | - |
| | Icebreaker Supra Mod | - | - | - | 6.00 |
| Colour | Dispers Blue | 0.025 | - | - | - |
| | Colanyl Green GG130 | - | 0.024 | - | - |
| | Sudangelb 150 | - | - | 0.025 | - |
| | Dispers Blue | - | - | - | 0.005 |

Table 1 (continued)

| EXAMPLE | COMPONENT | 1 | 2 | 3 | 4 |
|----------|------------------|--------|--------|--------|--------|
| Whitener | Titanium Dioxide | 0.07 | 0.07 | 0.07 | 0.07 |
| Water | | to 100 | to 100 | to 100 | to 100 |

In order to demonstrate the advantages of the present invention, blocks were prepared with and without the addition of the highly ethoxylated nonionic surfactant. Table 2 shows the available chlorine level (in parts per million) in water contacting a block according to the present invention and a block which did not include the nonionic.

Table 2

| AvC12 (ppm) | | |
|-------------|-------------|-------------|
| Time | 1% nonionic | 0% nonionic |
| 0 | 5 | 6.5 |
| 5 | 5 | 2 |
| 15 | 5 | 6.5 |
| 30 | 5 | 0.75 |
| 45 | 5 | 0.85 |
| 60 | 5 | 1.5 |
| 90 | 4 | 1.5 |
| 120 | 4 | 1.5 |

From the results given in Table 2, it can be seen that chlorine release is improved significantly in the presence of the nonionic surfactant.

Table 3 below shows the foam height (in centimeters) attained when a block according to the present invention was suspended from the rim of a toilet which was repeatedly flushed. The foam height is tabulated against the number of flushes.

Table 3

| Foam Height (cm) | | |
|------------------|-------------|-------------|
| Flushes | 0% nonionic | 1% nonionic |
| 3 | 0 | 1.8 |
| 30 | 0.5 | 2.5 |
| 60 | 0.5 | 3.0 |
| 75 | 1 | 4.5 |
| 90 | 1 | 4.75 |
| 145 | 1.5 | 4.75 |
| 145 | 1.5 | 5.5 |
| 160 | 1.5 | 5.3 |
| 175 | 1.5 | 5.1 |
| 190 | 2.0 | 4.9 |
| 205 | 2.0 | 4.7 |
| 220 | 2.0 | 4.5 |

Table 3 (continued)

| Foam Height (cm) | | |
|------------------|-------------|-------------|
| Flushes | 0% nonionic | 1% nonionic |
| 235 | 2.0 | 4.4 |
| 250 | 1.5 | 4.1 |

From the results in Table 3 it can be seen that the presence of the nonionic both significantly increases the maximum foam height (from 2.0 cm to 5.5cm) and ensures that the maximum foam height is reached after a shorter period of use.

Claims

1. Use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a foam booster in a lavatory block comprising an anionic surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent.
2. Use of 0.5-10%wt of an alkoxylated C8-C18 alcohol having, on average, 2-75 alkoxy units per alkyl moiety as a chlorine release improver in a lavatory block comprising an anionic surfactant, an inert and/or electrolyte filler and a water soluble bleaching agent.
3. Use according to claim 1 or 2 wherein the level of alkoxylated alcohol in the block is 0.75-2%wt.
4. Use according to claim 1 or 2 wherein the alkoxylated alcohol is an ethoxylated alcohol having an average ethoxy chain length of 40-60.
5. Use according to claim 1 or 2 wherein the block comprises 30 to 80% by weight of an anionic surfactant; 0 to 50% by weight of an inert and/or electrolyte filler and 5 to 50% by weight of a water-soluble bleaching agent.
6. Use according to claim 1 or 2 wherein the block comprises 5-15% of ionic filler and 5-15% of inert filler.
7. Use according to claim 1 or 2 wherein the block further comprises 1 to 15% by weight of a hydrophobic oily liquid perfume.

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